

Rhodora

JOURNAL OF THE
NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

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Vol. 25.

August, 1923.

No. 296.

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Boston, Mass.

300 Massachusetts Ave.



Providence, R. I.

Preston and Rounds Co.

RHODORA.—A monthly journal of botany, devoted primarily to the flora of New England. Price, \$2.00 per year, postpaid domestic and foreign; single copies (if available) 20 cents. Volumes 1-8 or single numbers from them can be supplied at somewhat advanced prices which will be furnished on application. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be gladly received and published to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than one page of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscripts and proofs to

B. L. ROBINSON, 3 Clement Circle, Cambridge, Mass.

Subscriptions, advertisements, and business communications to

W. P. RICH, 300 Massachusetts Avenue, Boston, Mass.

Entered at Boston, Mass., Post Office as Second Class Mail Matter.

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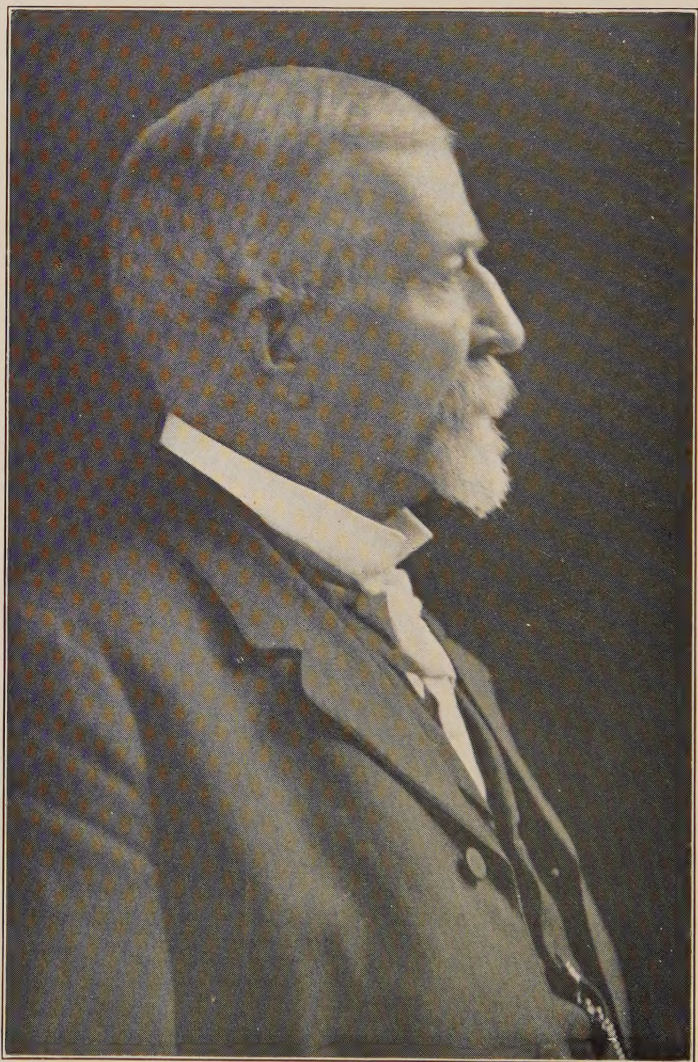
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Yours faithfully
J. L. Goodale

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GEORGE LINCOLN GOODALE.

L. H. BAILEY.

(With portrait.)

GEORGE LINCOLN GOODALE began life August 3, 1839 at Saco, Maine, and completed it April 12, 1923, at Cambridge, Massachusetts.

This bare statement may seem to signify little, but the life that was lived in those eighty-four years has great significance to a wide circle of associates and acquaintances and to the teaching of botany. To those who knew Dr. Goodale in his active teaching days at Harvard there remains a memory of a prompt, upstanding, positive, accomplishing character, master of his subject, unhesitating and convincing in his presentation of it. He succeeded to the teaching work of Asa Gray. It was a great career to follow. He continued the work without a personal departure and with rare loyalty at the same time that he gave it a particular direction.

Dr. Goodale's teaching naturally covered a wide range, but his was the special opportunity to present the enlarging subject of plant physiology as it was developed and understood by the best men of the day. He had good academic and scientific preparation. He had an acquisitive and analytic mind. He knew the necessary languages. He had personal acquaintance with the men and the laboratories in Europe. He brought this accumulation and experience to students in America in an authoritative way at a time when it was much needed. It was at length embodied in his *Physiological Botany*, 1885, comprising the second volume of Gray's projected "Botanical Text-Book," the third and fourth volumes of which, to be devoted to other subjects, were unhappily never completed.

One cannot go back to this text-book without being impressed by its thoroughness, the familiarity with the literature of the epoch as evidenced in the abundant citations, and by the logical, coherent, straightforward presentation. It stresses the chemical and physical relations of the subject. It is divided into two parts,—The Outlines of Vegetable Histology, and Vegetable Physiology, the second comprising about two-fifths of the treatment. It is a solid substantial book, that students of the present day would do well to understand.

But Dr. Goodale was interested not alone in precise laboratory studies. His "Wild Flowers of America," with colored plates from the drawings of Isaac Sprague, 1882, is still one of our choicest books for the plant-lover. Even as early as 1868 he had collaborated with Joseph Blake in the preparation of the "Portland Catalogue of Maine Plants." He was keenly interested in economic botany and in the practical improvement of useful and industrial plants, as well as in *materia medica*, to which his early studies and medical practice naturally led him. His presidential address before the American Association for the Advancement of Science at the Washington meeting, 1891, was on "Useful Plants of the Future." His interest in popular presentation of botanical subjects found expression also in the great Ware collection of Blaschka glass-models of plants in flower, which he was instrumental in securing and to the preparation of which he gave much personal attention, beginning as early as 1886; this unique collection is now one of the striking features of the Harvard Museums.

The breadth of his training and preparation is attested by the professional work in which he was engaged before he devoted himself to botany at Harvard. He practised medicine in Portland, Maine, 1863–66, having received M. D. from Bowdoin and Harvard in 1863; was state assayer of Maine, 1864; professor in natural science at Bowdoin, 1867–73, covering applied chemistry from 1868, and *materia medica* from 1870.

Dr. Goodale's active connection with Harvard began in 1872, as lecturer on vegetable physiology and instructor in botany. In 1873 he became assistant professor in vegetable physiology; in 1878 he was made full professor of botany; from 1879–1909 he was director of the botanic garden and curator of the botanical museum. From 1888 to 1909 he was Fisher Professor of Natural History at Harvard, the title previously held by Gray, and in 1909, on his retirement, was

made Fisher Professor Emeritus. In 1890-91 he visited Ceylon, Java, Straits Settlements, Australia, and Japan, adding greatly to his rich accumulation of botanical knowledge. His later years were lived quietly in Cambridge.

His work was well known outside of Harvard University. In 1890 he received the degree of LL.D. from Amherst College, where he had taken his baccalaureate degree in 1860 and from which he received A. M. in 1866; in 1894 from Bowdoin; in 1896 from Princeton. In 1889 he was vice-president of the Biological Section of the American Association for the Advancement of Science, and 1890-91 president of the Association. He was a fellow of the American Academy of Arts and Sciences, member of the American Philosophical Society, National Academy of Sciences; honorary fellow of the New York Academy of Sciences and of the Royal Society of New Zealand; at one time he was associate editor of the *American Journal of Science*, and was in attendance at the International Botanical Congress at Brussels in 1910; he held membership in the various botanical societies.

Dr. Goodale came of a distinguished father. Stephen Lincoln Goodale (1815-1897) succeeded to the drug business of his father, and early became interested in the chemical and botanical phases of pharmacy; this interest he extended to horticulture and crop-production, and he developed what was then the best growing collection of fruits and ornamental plants in Maine. From 1856-1872 he was secretary of the Maine State Board of Agriculture, editing sixteen volumes of reports which are well known to this day for their excellence. In 1861 he published "*The Principles of Breeding*," which is an able discussion of the physiological laws involved in the reproduction and improvement of domestic animals, and was long a leading presentation of the subject. He became interested in the manufacture and use of commercial fertilizers, and with Gail Borden started a factory as early as 1863 for the manufacture of condensed milk. He also was concerned in the manufacture of beef extract by the Liebigs process. He was once a trustee of the State College of Agriculture and Mechanic Arts, now the University of Maine. His correspondence was extensive with scientific men in this country and abroad.

George Lincoln Goodale married Henrietta Juel Hobson in 1866, who survives him, as do his two sons, Dr. Joseph Lincoln Goodale, Boston, and Francis G. Goodale of Weston, Massachusetts, as well

as a brother, Dr. Walter Temple Goodale, Saco, Maine. The funeral services were held at St. John's Memorial Chapel, April 14, 1923, Dean Washburn of the Episcopal Theological School officiating. The pall-bearers were President Emeritus Charles W. Eliot, President A. Lawrence Lowell, Dr. Henry P. Walcott, Professor Oakes Ames, Edwin Abbott, Samuel Henshaw, Walter Deane, H. Clifford Gallagher, Dr. Robert T. Jackson, Professor W. J. V. Osterhout, Professor Roland Thaxter. The remains were taken to Saco, Maine, there at last to rest with the long family associations.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY.

NEW SERIES.—No. LXIX.

A. BRACKETT.

I. REVISION OF THE AMERICAN SPECIES OF *HYPOXIS*.

THE genus *Hypoxis* occurs mostly in the southern hemisphere, extending into the northern hemisphere in subtropical Asia and by way of Mexico and the Antilles to the Atlantic slope of North America. All of our species have corms accompanied by somewhat fleshy root-fibers. They are herbs with grass-like, linear-lanceolate to nearly filiform and generally pilose leaves. The scapes are simple, one- to several-flowered. The peduncles are in general slightly pilose especially above, often glabrescent below. The pedicels are generally quite short; the bracts (when present) are setaceous and generally shorter than the pedicels. The ovary and capsule, commonly rather pilose when young, become nearly glabrous at maturity. The perianth-segments are narrowly elliptic, glabrous, yellow or white within, green and pilose without. The capsule is subglobose to subcylindric, generally three-lobed. The anthers of the American species are usually versatile but in one species, *H. sessilis* L., they are basi-fixed. The seeds are small, dark-colored, subglobose, muricate, bearing a beak and rostrate hilum.

In his *Synopsis of Hypoxidaceae*, Baker¹ recognized only three species of *Hypoxis* in all America, *H. juncea* Smith, *H. erecta* L. = *H. hirsuta* (L.) Coville and *H. decumbens* L. These were placed

¹J. G. Baker, Journ. Linn. Soc. xvii. 93-126 (1878).

in his subgenus *Euhypoxis*, characterized by versatile anthers, while the species with basifixed anthers (and glabrous foliage) constituted his subgenus *Ianthe* of Australia and the Cape of Good Hope. *H. sessilis* of the Atlantic coastal plain is, therefore, of special interest since it has the pilose leaves and perianth of *Euhypoxis* but the basifixed anthers of *Ianthe*.

Baker's reduction of all the species in North and South America to three was natural because he was working with only the superficial characters. In attempting to place satisfactorily material of *H. sessilis* (the American species with basifixed anthers, not generally recognized since its publication by Linnaeus), it was found that the species of the United States are clearly separated by their seeds. The seed-characters proved so satisfactory, in this limited area, that the study was extended to cover the plants of the West Indies, Mexico, Central and South America. In carrying on this work I have examined the material in the Gray Herbarium and have been generously loaned the American specimens in the herbaria of the New York Botanical Garden, the Academy of Sciences of Philadelphia, the United States National Museum and the Missouri Botanical Garden. I wish here to express my thanks for the use of this material to those in charge of the different collections: Professors Robinson and Britton and Doctors Pennell, Maxon and Greenman. Throughout the work I have had the constant suggestions and aid of Professor Fernald and much aid in the bibliography from Miss Day and Miss Vincent of the Gray Herbarium library.

I have made critical studies of all the fruiting material available. The seed-characters of the plants from south of the United States prove as satisfactory as was hoped and, supported by other characters, indicate that there are at least fifteen, instead of only three American species. The regions in America where *Hypoxis* seems to have the greatest variety of species are the southeastern and Gulf coastal plain of the United States (from South Carolina to Texas), the upland of Mexico and the northern Andes. It is probable that South America will furnish more species than are here treated: the material seen from that region has been very scanty and at least two of the South American species described by Humboldt, Bonpland and Kunth have not been satisfactorily matched, and new species are likely to be discovered.

The results of this study are embodied in the following key to and synopsis of the American species. In the drawings I have shown the habit ($\times \frac{1}{2}$) and the seed (approximately $\times 40$) of each species.

KEY TO SPECIES

- A. Mature seeds black B.
 - B. Leaves linear-filiform, canaliculate or involute, less than 1 mm. broad; seeds with truncated, irregularly carved murications 1. *H. juncea*.
 - B. Leaves linear to lanceolate, broader; seeds muricate, papillose or with rounded pebbling C.
 - C. Sheaths not usually disintegrating into bristles at the base D.
 - D. Seeds covered with numerous, closely crowded, spine-like murications, lustrous E.
 - E. Leaves 1-8 mm. broad, stiff and loosely ascending; peduncles stiffish, usually 2-7-flowered; mature ovary loosely and densely villous; seeds with murications sharp-pointed 2. *H. hirsuta*.
 - E. Leaves 3.5-12 mm. broad, very thin and flaccid; peduncles capillary and lax, 1-3 (rarely 4)-flowered; mature capsule slightly pubescent to glabrate; seeds with bluntish murications coarser than in typical *H. hirsuta* 2a. *H. hirsuta*, var. *leptocarpa*.
 - D. Seeds covered with often nearly confluent, low, rounded pebbling, generally not lustrous; leaves flaccid F.
 - F. Scapes 1-4-flowered 3. *H. decumbens*.
 - F. Scapes generally 4-8-flowered; larger form, usually more pilose 3a. *H. decumbens*, var. *major*.
 - C. Sheaths disintegrating into fibers G.
 - G. Leaves rather stiff and pilose; fibers forming generally rather dense tufts; scapes 1-2-flowered; the pedicels shorter than the flowers; seeds covered with low, rounded, closely approximate pebbling 4. *H. rigida*.
 - G. Leaves flaccid, becoming only slightly fibrillous; scapes 2-4-flowered; the pedicels much exceeding the flowers; seeds papillose, bearing irregularly elongate, obtuse papillae 5. *H. tepicensis*.
- A. Mature seeds brown or drab (black only underlying the outer coat and about the beak and rostrate hilum), sometimes showing iridescence H.
 - H. Seeds iridescent I.
 - I. Anthers nearly basifixed; the basal lobes short and rounded; leaves linear-lanceolate, not distinctly narrowed at the base; flowers solitary, often nearly sessile; seeds with gold or blue colors predominating 6. *H. sessilis*.
 - I. Anthers versatile; the basal lobes longer, tapering at the ends; leaves linear-lanceolate, narrowed almost to petioles near the base; scapes 1-2-flowered; seeds black beneath the exfoliating outer coat which clings as remnants about the flat pebbling and shows flecks of iridescence 7. *H. breviscapa*.
 - H. Seeds not iridescent or rarely with slight iridescent fleckings J.
 - J. Seeds rarely showing any black except at beak or hilum K.

- K. Seeds minutely muricate, beak nearly obsolete; basal sheaths membranous, often thick and dark, rarely becoming fibrillous; scapes 1-few-flowered.8. *H. micrantha*.
- K. Seeds more coarsely muricate; beak well developed L.
- L. Beak and hilum set in a lustrous, black, wedge-shaped spot; murications stiff, conical and sharp-pointed; basal sheaths becoming quite fibrous.9. *H. potosina*.
- L. Beak and hilum not set in a lustrous, wedge-shaped spot M.
- M. Seeds covered with low, blunt, corrugated pebbling; basal sheaths membranaceous, generally becoming fibrillous.10. *H. Wrightii*.
- M. Seeds covered with spine-like or subulate processes N.
- N. Outer coat of loose texture, wrinkled and pinched into scarcely confluent, little peaks, persistent; basal sheaths becoming fibrous.11. *H. rugosperma*.
- N. Outer coat of firmer texture, covered with sharp or obtuse spine-like processes O.
- O. Basal sheaths disintegrating into dense fibers; seeds with firm conical, obtuse, scarcely confluent processes.12. *H. fibrata*.
- O. Basal sheaths becoming somewhat fibrillous; seeds darker, with firm, sharp-pointed, rather crowded processes, the sides of which seem to be grooved or lined.13. *H. humilis*.
- J. Seeds generally showing much of the black under coat P.
- P. Murications rather sharp, fine and closely crowded, the outer seed-coat exfoliating irregularly, especially the brown tips of the murications adhering to the low, flat markings of the inner coat; sheaths rarely becoming fibrillous.14. *H. mexicana*.
- P. Murications very low and broad, the remnants of the outer coat adhering irregularly, especially around the bases of the low, black processes; seeds mostly black; sheaths scarcely fibrillous.15. *H. catamarcensis*.

1. *H. JUNCEA* Smith. Corm elongate, 5-12 mm. thick, covered with membranous or slightly fibrillous, brown sheaths: leaves filiform, canaliculate or involute, 0.4-0.8 mm. broad, up to 3.5 dm. long: peduncles filiform, loosely pilose or glabrate, 0.5-2 dm. long, 1-2-flowered: ovary and capsule densely pilose: perianth with lanceolate to narrowly elliptic, acutish segments, 0.8-1.5 cm. long: capsule ellipsoid, 4-6 mm. long: seeds about 1 mm. in diameter, black, lustrous, the outer coat covered with flattened or truncated pebbling.—Spicil. ii. 15, t. 16 (1792): Willd. Spec. ii. 110 (1799): Aiton fil. Hort. Kew. ed. 2: ii. 255, (1811): Pursh, Fl. Sept. Amer. i. 224 (1814): Roem. & Schultes, Syst. Veg. vii. 761 (1830). *H. filifolia* Elliott, Sketch, 397 (1817).—Pine barrens of Florida, locally north to South Carolina.

Elliott in his *Botany of South Carolina* said he had not seen any species of *Hypoxis* that was strictly one-flowered although he accorded

H. juncea recognition as a species on "the high authority of Sir J. E. Smith." He also called the few-flowered but otherwise similarly described plant *H. filifolia*. I have examined seeds of both the one- and the few-flowered specimens and I have found practically no differences between them. The original description and plate are characteristic although Smith stated that his plant was "Discovered



FIG. 1. *H. juncea* and seed.

in boggy ground in Carolina by the indefatigable Mr. John Fraser, from whose garden this specimen was obtained." *H. juncea* is very common in Florida and, judging by herbarium representation, rare in Georgia and extremely local in South Carolina (seen only from Charleston). Prior to the publication of *H. juncea*, Fraser had collected extensively in South Carolina and in Georgia and since Elliott's *H. filifolia* also came from South Carolina and Georgia it may be that *H. juncea* has a broader range than herbarium-material

indicates. It is possible, however, that Elliott, who lived at Charleston, knew the plant at the northern limit of its range. *H. juncea* has been credited to Alabama but upon the only reputed Alabama specimen in the National Herbarium, Mohr made the memorandum: "Locality doubtful, of later years not found in Alabama." The species is not admitted in Mohr's *Plant Life of Alabama*.

The following are referred here. SOUTH CAROLINA: *M. A. Curtis*, fragmentary specimen (hb. Mo. Bot. Gard.); near Charleston, *Beyrich* (hb. Mo. Bot. Gard.). GEORGIA: one plant, ex. herb. George Thurber (hb. Gray); three plants, *Le Conte* (hb. Phil. Acad.); plant collected by *Dr. Harden* in 1884 (hb. Phil. Acad. no. 567726) of doubtful authenticity since the specimen is of separate, filiform, canaliculate leaves stuck loosely around an *Hypoxis* scape which is badly preserved; Chatham County, Savannah, *C. S. Williamson* (hb. Phil. Acad.); Wayne County, Jessup, low pine barrens, *A. Ruth*, 1893 (hb. Mo. Bot. Gard.); Berrian County, *Le Conte* (hb. Phil. Acad.); Camden County, St. Mary's, *D. B. Smith* (hb. Phil. Acad.); Lowndes County, rather dry pine barrens south of Melrose, geological formation, Oligocene overlaid by Lafayette and Columbia, altitude 48.8 meters (160 feet), *Roland M. Harper*, no. 1604 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. Gray, hb. N. Y. Bot. Gard.). FLORIDA: Since the bulk of the herbarium material of this species comes from Florida only specimens having seeds or their duplicates are cited from this state. Duval County, pine barrens near Jacksonville, *A. H. Curtiss*, no. 2838 (hb. Gray, hb. Phil. Acad., hb. Mo. Bot. Gard., hb. U. S. Nat. Mus.); Franklin County, low pine barrens, Apalachicola, no. 2527^a, "distribution of duplicates of the Chapman herb" (hb. U. S. Nat. Mus., hb. Gray); Lake County, collected in the vicinity of Eustis, low pine land, *Geo. V. Nash*, no. 952 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard., hb. Gray); in vicinity of Eustis, *Geo. V. Nash*, no. 789 (hb. Phil. Acad., hb. U. S. Nat. Mus.) and no. 2072 (hb. U. S. Nat. Mus.); Brevard County, Indian River, *Edward Palmer*, no. 557 (hb. U. S. Nat. Mus., hb. Gray); Polk County, wet soils, *L. B. Ohlinger*, no. 599 (hb. Mo. Bot. Gard.); Pinellas County, Dunedin, *S. M. Tracy*, no. 6866 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard.); Manatee County, in pine forests, Osprey, *Benjamin H. Smith*, (hb. Phil. Acad.); Bradentown, *S. M. Tracy*, no. 7514 (hb. Mo. Bot. Gard.); Lee County, vicinity of Fort Myers, in pineland, *Miss Jeanette P. Standley*, no. 7 (hb. U. S. Nat. Mus., hb. Gray, hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard.) and in pine woods, *Paul C. Standley*, no. 12963 (hb. U. S. Nat. Mus.). Locality unknown, *Chapman*, two sheets with seeds, one in the Gray Herbarium and the other in the herbarium of the Mo. Bot. Gard. ALABAMA: hb. Charles Mohr "locality doubtful, of later years not found in Ala., not admitted in catalogue," *Buckley* (hb. U. S. Nat. Mus.).

This material was mostly distributed as *H. juncea* or as *H. filifolia*.

2. *H. HIRSUTA* (L.) Coville. Corm subglobose to ellipsoid, 0.5–2 cm. thick, covered with membranaceous, pale or brown-tinged sheaths not becoming fibrillous: leaves linear, rather firm, 1–8 mm. broad, 1–6 dm. long; peduncles filiform, stiffish or spreading, 0.4–3.5 dm. long, mostly 2–7-flowered; the pedicels elongate; ovary and capsule densely pilose; perianth-segments lanceolate to elliptic or narrowly ovate, 0.5–1.5 cm. long; capsule ellipsoid, 2–6 mm. long; seeds 0.8–1.3



FIG. 2. *H. hirsuta* and seed.

mm. in diameter, black, lustrous; the outer coat closely covered with sharp mucronations.—Mem. Torr. Bot. Cl. v. 118 (1894). *Ornithogalum hirsutum* L. Sp. 306 (1753). *H. erectum* L. Syst. ed. 10, ii. 986 (1759). *H. pallida* Salisb. Prodr. 248 (1796). *H. carolinensis* Michx. Fl. Bor.-Am. i. 188 (1803). *H. graminea* Pursh, Fl. Am. Sept. i. 224 (1814). *H. grandis* Pollard in Small, Fl. S. E. U. S. 287 and 1329 (1903).—Open woods, meadows, and pastures, southern New Hampshire to Manitoba, south to Florida and Texas, ascending in the southeastern states to an altitude of 1220 meters (4000 feet).

Extremely variable in breadth of leaf and size and shape of perianth-segments but throughout its range not readily separated into definite

varieties. The broad-leaved plant distinguished as *H. grandis* Pollard from the southern states is often found north to New York and New England while the narrowest-leaved phase, *H. carolinensis* Michx., occurs westward to Manitoba, Minnesota, Iowa and Oklahoma. The seed ordinarily has very sharp murications but often the northern plant has the murications broader and less acute than usual thus closely connecting the typical plant with the variety. Since *H. hirsuta* is so very common and the various herbaria contain hundreds of sheets, only a few specimens, with seeds unless otherwise stated, and their duplicates at the limits of the ranges, as shown by the herbarium material, are cited here.

NEW HAMPSHIRE: Pelham, Hillsboro County, *Clarence H. Knowlton* (hb. Gray). MASSACHUSETTS: swamp, Falmouth, Barnstable County, *Clarence H. Knowlton* (hb. Phil. Acad., hb. Gray). CONNECTICUT: Bridgeport, *E. H. Fames*, no. 1 (hb. Gray). NEW YORK: Long Island, *H. von Schrenk* (hb. Mo. Bot. Gard.). NEW JERSEY: between Tuckerton and Atsion, *C. F. Saunders & W. N. Clute* (hb. Phil. Acad.). DELAWARE: dry soil, Greenbank, *A. Commons* (hb. Mo. Bot. Gard.). MARYLAND: Baltimore County, *John Donnell Smith* (hb. U. S. Nat. Mus.). VIRGINIA: Bay Bank, Hampton, *D. Harrison* (hb. U. S. Nat. Mus.). SOUTH CAROLINA: Newry, Oconee County, *H. D. House* (hb. Mo. Bot. Gard.). GEORGIA: Stone Mountain, *H. Eggert* (hb. Mo. Bot. Gard.). ALABAMA: *Charles L. Pollard & William R. Maxon*, no. 72 (hb. U. S. Nat. Mus.). MISSISSIPPI: dry soil, Meridian, Lauderdale County, *Biltmore Herb.*, no. 529^c (hb. U. S. Nat. Mus.). TEXAS: Dallas, damp sands, *Reverchon*, no. 2760 (hb. Mo. Bot. Gard.). OKLAHOMA: Page, *O. W. Blakley*, no. 1408 (hb. Mo. Bot. Gard., hb. Gray. hb. U. S. Nat. Mus.) and no. 3433. (hb. Mo. Bot. Gard., hb. Gray). COLORADO: Denver, *Schneck*, without seeds (hb. Mo. Bot. Gard.). NEBRASKA: meadow, Platte Islands, Kearney, *Ernest R. Holmes* (hb. N. Y. Bot. Gard.). SOUTH DAKOTA: Brookings, *Thos. A. Williams* (hb. Mo. Bot. Gard.). NORTH DAKOTA: Butte, Benson County, *Dr. J. Lunell* (hb. N. Y. Bot. Gard.). ASSINIBOIA: near Moose Mt. Creek, meadows and open woods, *Jas. M. Macoun* (hb. Gray). MANITOBA: Stony Mt., *John Macoun*, no. 13799 (hb. Gray).

2a. Var. **leptocarpa** (Engelmann & Gray), n. comb. Leaves very thin and flaccid, often quite glabrous, 3.5–12 mm. broad, 2–8 dm. long; peduncles very slender and lax, mostly 1–3 (rarely 4)-flowered; perianth-segments 5–8 mm. long; mature capsules 4–10 mm. long, slightly pubescent to glabrate; seeds black, with bluntish murications. —*H. erecta*, var. *leptocarpa* Engelmann & Gray, Bost. Journ. Nat. Hist. v. 239 (1845). *H. leptocarpa* Engelmann in Engelmann & Gray, l. c. (1845). *H. Curtissii* Rose in Small Fl. S. E. U. S. 287 and

1329 (1903). *H. decumbens* Chapman, Fl. ed. 2, supplement 2: 696 (1892), not L.—Wet woods, swamps and bottom-lands, North



FIG. 3. *H. hirsuta*, var. *leptocarpa*.

Carolina to Florida and Texas. The following specimens are referred here. NORTH CAROLINA: in damp clay soil, Goldsboro, Wayne County, *Biltmore Herb.*, no. 529^d, with seeds (hb. U. S. Nat. Mus.).

GEORGIA: rich damp woods, Dublin, Laurens County, *R. M. Harper*, no. 1365 (hb. Gray, hb. U. S. Nat. Mus., hb. Mo. Bot. Gard.). FLORIDA: Apalachicola, with seeds, *Chapman* (hb. N. Y. Bot. Gard.); shore of St. John's River at Toco, growing in water, *A. H. Curtiss*, no. 2837*, with seeds (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard.) distributed as *H. leptocarpa* Engelm.; swamps near Jacksonville, *A. H. Curtiss*, no. 4727, with seeds (hb. U. S. Nat. Mus., hb. N. Y. Bot. Gard.); river banks, Apalachicola, *Chapman*, no. 4015, with seeds (hb. U. S. Nat. Mus.), distributed as *H. decumbens* L.; Palmetto, *S. M. Tracy*, no. 6621 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. Gray). LOUISIANA: Lake Charles, Calcasien Parish, *E. J. Palmer*, no. 8519 (hb. Mo. Bot. Gard.). TEXAS: sandy soil, near water courses, *F. Lindheimer*, no. 188 (hb. Gray).

3. *H. DECUMBENS* L. Corm cylindric to ellipsoid, 0.7–2 cm. thick; the membranaceous sheaths not fibrillous: leaves flaccid, often falcate, linear to lanceolate, 2–12 mm. broad, 1–4 dm. long, sparsely pilose to glabrate; peduncles filiform, loosely ascending or recurving, 0.2–2 dm. long, villous above, 1–4-flowered; perianth-segments lanceolate, acute, 4–10 mm. long; mature pedicels 1–20 mm. long, mostly equalled by the bracts; capsule club-shaped, cylindric or slenderly ellipsoid, usually densely pilose, 0.6–1.7 cm. long; seeds 0.8–1.2 mm. in diameter, black, dull or but slightly lustrous, covered with low, rounded scarcely confluent pebbling.—Pl. Jam. Pugill. 11 (1759) & Syst. ed. 10, 986 (1759). *H. caricifolia* Salisb. Prodr. 248 (1796). *H. gracilis* Lehm. ex Schultes f. Syst. vii. 764 (1830). *H. decumbens*, var. *mexicana* (Schultes f.) Jennings, Ann. Carnegie Mus. xi. 97 (1917).—In open woods and pastures in the Antilles, tropical Mexico and South America. Since the herbarium material is so abundant for this species only one or two typical plants having seeds, and their duplicates, from each locality are cited here. CUBA: near Monte Verde, *C. Wright*, no. 1515 (hb. Gray, hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard.). JAMAICA: Cinchona, *Willard N. Clute*, no. 208 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. Phil. Acad., hb. Gray). HAITI: on banks, Petit Borgne to Mt. Casse, *George V. Nash*, no. 488 (hb. N. Y. Bot. Gard.); on banks, Mt. Maleuvre to Mt. Piment, *Geo. V. Nash & Norman Taylor* no. 1183 (hb. N. Y. Bot. Gard.). SAN DOMINGO: Prov. of Vega, *Miguel Fuertes*, no. 1704 (hb. N. Y. Bot. Gard.). PORTO RICO: in pineapple plantations near Mayaguez, *Holm*, no. 67 (hb. Mo. Bot. Gard., hb. Gray). TORTOLA: hillside, 325 m. alt., *N. L. Britton & J. A. Shafer*, no. 779 (hb. N. Y. Bot. Gard., hb. U. S. Nat. Mus.). ANTIGUA: *J. N. Rose, Wm. R. Fitch & Paul G. Russell*, no. 3346 (hb. U. S. Nat. Mus., hb. N. Y. Bot. Gard.). DOMINICA: *Francis E. Lloyd*, no. 579 (hb. N. Y. Bot. Gard.). MARTINIQUE: *Père Duss*, no. 2011 (hb. U. S. Nat. Mus., hb. N. Y. Bot. Gard.). ST. VINCENTS: *H. H. Smith, G. W. Smith, & Conn. F. D. Godman*, no. 14 (hb. N. Y. Bot. Gard.). TOBAGO: Mason Hall near the river, *W. E. Broadway*,



FIG. 4. *H. decumbens* and seeds (showing variation).

no. 4724 (hb. Gray, hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard.). MEXICO: Alvarez, state of San Luis Potosi, Dr. Edward Palmer, no. 232 (hb. Mo. Bot. Gard., hb. U. S. Nat.

Mus., hb. N. Y. Bot. Gard.). COSTA RICA: *Tonduz*, no. 8028 (hb. U. S. Nat. Mus.). PANAMA: moist field at foot of *Piedro de Lino*,



FIG. 5. *H. decumbens*, var. *major*.

E. P. Killip, no. 3570 (hb. U. S. Nat. Mus.). COLOMBIA: forests of Popayan, *Lehmann*, no. 7599 (hb. N. Y. Bot. Gard.). FRENCH GUIANA: vicinity of Cayenne, *W. E. Broadway*, no. 220 (hb. Gray, hb. N. Y. Bot. Gard.). EQUADOR: in the Andes, *R. Spruce*, no.

5068 (hb. Gray). BRAZIL: near Rio de Janeiro, from the herbarium of the U. S. South Pacific Exploring Expedition under the command of Capt. Wilkes, U. S. N. 1838-42 (hb. Gray). GALAPAGOS ISLANDS: common in open woodlands at 183 m. (600 ft.), Albemarle, *Alban Stewart*, no. 1135 (hb. Mo. Bot. Gard., hb. U. S. Nat. Mus., hb. Gray). PARAGUAY: *Dr. E. Hassler*, no. 5562 (hb. Gray).

This material was mostly distributed as *H. decumbens*.

3a. Var. MAJOR Seubert. Plants coarser than the above; seeds similar.—Seubert in Mart. Fl. Brasil. iii. pt. i. 51, t. 7, f. 1 (1847). *H. racemosa* Donnell Smith, Bot. Gaz. xiv. 30 (1889).—Locally throughout the range of the above. The following are referred here. MEXICO: Orizaba, *Botteri*, no. 80 (hb. Gray), no. 455 (hb. Gray), 463 (hb. Gray); Mt. Orizaba, *Henry E. Scaton* (hb. Gray). SAN LUIS POTOSI: Alvarez, *Dr. Edward Palmer*, no. 581 (hb. U. S. Nat. Mus.). VERA CRUZ: near Jalapa, *J. N. Rose & Walter Hough*, no. 4326 (hb. U. S. Nat. Mus.). JAMAICA: Tyre, near Troy, *Wm. Harris*, no. 9401 (hb. U. S. Nat. Mus.). GUATEMALA: Dept. Alta Verapaz, *H. von Tuerckheim*, no. 3842 (hb. U. S. Nat. Mus.); Coban, Dept. Alta Verapaz, *Tuerckheim*, no. 33 (hb. Gray). COLOMBIA: Santa Marta, *Herbert H. Smith*, no. 2266 (hb. Gray). VENEZUELA: *A. Fendler*, no. 1565 (hb. Gray, hb. N. Y. Bot. Gard.). TRINIDAD: from herb. of Otto Kuntze, no. 959 (hb. N. Y. Bot. Gard.); Lookout Hill, *W. E. Broadway* (hb. Mo. Bot. Gard.). BRAZIL: near Rio de Janeiro, hb. of the U. S. South Pacific Exploring Expedition under the command of Capt. Wilkes, U. S. N. (hb. U. S. Nat. Mus.). PARAGUAY: *Fiebrig*, no. 891 (hb. Gray).

This material was distributed simply under the generic name or, if further determined, as *H. decumbens* or as *Curculigo scorzoneraefolia* (Lam.) Baker.

4. *H. RIGIDA* Chapman. Corm subcylindric to ellipsoid, 0.6-1.5 cm. thick, covered with the stiff bristly bases of the old sheaths or rarely with membranous, slightly disintegrating leaf bases; leaves rather rigid, linear, 1-4 mm. broad, 0.7-4 dm. long; peduncles glabrate, 0.3-3 dm. long, 1-3-flowered; ovary and capsule pilose; perianth-segments 7-12 mm. long, lanceolate to oblong, acutish, densely pubescent without; capsule narrowly obovoid, 1-9 mm. long; seeds 1 mm. in diameter, black, opaque or slightly lustrous, covered with short, rounded, approximate pebbling.—Fl. So. U. S. ed. 2. Suppl. 2: 696 (1892).—Low pine barrens, North Carolina to Florida and Texas. The following are referred here. LOCALITY UNKNOWN: one plant with seeds (hb. Gray); *Chapman*, no. 4573, without seeds (hb. Mo. Bot. Gard.). FLORIDA: *F. Rugel*, 1842-1849, ex herb. Mus. Brit., without seeds (hb. Mo. Bot. Gard.); Apalachicola, *Chapman*, with seeds (hb. U. S. Nat. Mus.), *Chapman*, ex herb. Chas. Mohr (hb. U. S. Nat. Mus.). ALABAMA: Mobile, *Chas. Mohr*,

without seeds (hb. U. S. Nat. Mus.). MISSISSIPPI: Biloxi, *S. M. Tracy*, no. 5090 (sheets with and without seeds at hb. U. S. Nat. Mus., also one sheet without seeds at hb. Mo. Bot. Gard.), no. 5091, without seeds (hb. U. S. Nat. Mus.), no. 5092, with seeds (hb. U. S.



FIG. 6. *H. rigida* and seed.

Nat. Mus.), no. 5093, without seeds (hb. U. S. Nat. Mus.), Ocean Springs, without seeds (hb. Mo. Bot. Gard.). LOUISIANA: open sandy ground, Natchitoches Parish, *E. J. Palmer*, no. 1566, with seeds (hb. Mo. Bot. Gard.); Alexandria, *Josiah Hale*, with seeds (hb. U. S. Nat. Mus.). TEXAS: thirty miles northeast of Beaumont, *W. L. Bray*, no. 68, without seeds (hb. U. S. Nat. Mus.); Swan, swamps,

"flowers shut after noon," *J. Reverchon*, no. 2759, with seeds (hb. Mo. Bot. Gard., hb. U. S. Nat. Mus.); Pine Island, Angelina, *J. Reverchon*, no. 2780, without seeds (hb. Mo. Bot. Gard.).

As shown by the herbarium sheets this plant has sometimes been distributed as *H. juncea* Smith. Although rarely it tends to approach *H. juncea* in habit, generally it has a dense tuft of coarse fibers at the base and wider leaves. It has also been distributed as *H. decumbens* L., but superficially it differs from *H. decumbens* in having a stiff tuft of bristles at the base, while the leaves of *H. decumbens* do not disintegrate into fibers. Most often it has been distributed as *H. hirsuta* (L.) Coville. The bristly base and the coarser texture of the leaves should superficially distinguish it from *H. hirsuta*. The seeds clearly separate it from each of the above mentioned species.

5. **H. tepicensis**, n. sp., cormo ellipsoideo 9 mm. crasso vaginis scariosis fibrillosis pallide brunneis investo; foliis linearibus subrigidis 3-6 mm. latis 0.6-4 dm. longis sparse pilosis; pedunculis sparse pilosis vel glabratibus 0.4-3 dm. longis; pedicellis arcuatis 2-5 cm. longis; ovario capsulaque pilosis; segmentis perianthii lanceolatis subacutis 7-10 mm. longis extus viridibus; capsulis ellipsoideis 4-8 mm. longis; seminibus 0.7-1.3 mm. diametro atris densissime papillo-sis, papillis valde elongatis obtusis.

Corm ellipsoidal, 9 mm. thick, covered with scarious, fibrillous, light brown sheaths; leaves linear, rather rigid, 3-6 mm. broad, 0.6-4 dm. long, sparsely pilose; peduncles sparsely pilose or becoming glabrate, 0.4-3 dm. long; pedicels curving, 2-5 cm. long; ovary and capsule pilose; perianth-segments lanceolate, rather acute, 7-10 mm. long, green outside; capsule ellipsoidal, 4-8 mm. long; seeds 0.7-1.3 mm. in diameter, black, very densely papillose; the papillae strongly elongated and obtuse.—In western Mexico. The following are referred here. **TEPIC**: Pedro Paulo, *J. N. Rose*, no. 3319, as the TYPE of this species, with seeds (hb. U. S. Nat. Mus.); between Pedro Paulo and San Blascito, *J. N. Rose*, no. 3307, with seeds (hb. U. S. Nat. Mus.).

6. **H. sessilis** L. Corm cylindric to slenderly ovoid, 0.5-1 cm. thick, covered with membranous but scarcely fibrillous brown sheaths; leaves linear, 1-4 mm. broad, 0.7-3 dm. long, firm; peduncles essentially wanting or up to 8 cm. long, filiform, pilose; ovary and capsule densely pilose; perianth-segments lanceolate, rather acute, 7-12 mm. long; capsule pyriform, 3-4 mm. long; seeds black, ellipsoid, 1-4 mm. in diameter; the low, flat pebbling almost completely covered with a closely granular film or coating of a golden-brown iridescent material; the short beak and rostrate hilum black.—*Sp. Pl.* ed. 2. 439 (1762). *H. erecta*, β *acstivalis* Engelm. & Gray, *Bost. Journ.*

Nat. Hist. v. 239 (1845).—Dry pine barrens and sandy openings, in the southern United States.



FIG. 7. *H. tepicensis* and seed.

Linnaeus based *H. sessilis* solely upon *Ornithogali Virginici facie*, *Herba tuberosa carolinensis* of Dillenius, Hort. Elth. ii. 298 t. 220 f. 287. This plant was described as coming from Carolina and having sessile flowers. Although the description and the conventional plate

are not conclusive the plant here treated as *H. sessilis* was presumably intended. The Carolina plant, as shown by herbarium material, does not have the flower strictly sessile, nor are the leaves as large as in Dillenius's plate; but the latter besides being crude was made from a cultivated plant. In view of this plant from "Carolina" it would be unwise to set up as a distinct species the plant we actually know from that region.



FIG. 8. *H. sessilis* and seed.

Some excellent specimens in the herbarium of the Missouri Botanical Garden were sent to Bernhardt labeled in Engelmann's hand *H. erecta* β *aestivalis*; other material originally retained by Engelmann (with Lindheimer's field label) is unmarked, but is identical with the material sent Bernhardt and the fragmentary plants in the Gray Herbarium, originally marked by Dr. Gray as var. *aestivalis*. These specimens are without seeds but they seem identical with the material from the southeastern United States that is called *H. sessilis*.

The following are referred to this species. LOCALITY UNKNOWN: *Chapman*, no. 3856, with seeds (hb. Mo. Bot. Gard.). NORTH CAROLINA: Wilmington, *C. S. Williamson*, without seeds (hb. Phil. Acad.). SOUTH CAROLINA: sandy loam in open places, Summerville, *B. L. Robinson*, no. 176, without seeds (hb. Gray). FLORIDA: *F. Rugel*, 1842–1849, ex herb. Mus. Brit. no. 132, without seeds (hb. Mo. Bot. Gard.). ALABAMA: ex herb. George Thurber, with seeds (hb. Gray); *Gates*, with seeds (hb. Phil. Acad.); *Buckley*, with seeds (hb. N. Y. Bot. Gard.). TEXAS: *Lindheimer*, no. 187, without seeds (hb. Gray, hb. Mo. Bot. Gard.). Also two specimens from South Carolina. One was sent in a letter by M. A. Curtis, from Society Hill, Sept. 15, 1853, to Dr. Gray with the following remarks, "I send also an abortive *Hypoxis* now not uncommon here as a second growth of the season. Flower three cleft, white." The seeds of this plant have very little of the golden iridescent coloring but show a marked preponderance of a brilliant blue color. The other was sent by Miss Laura M. Bragg to Professor Fernald from Dackon, Berkeley Co., with the following field label, "In second growth . . . pine-land. Broom grass association. Coll. . . . June 21, 1920." Both of the above specimens have longer leaves than the usual *H. sessilis* and the flowers are only three-cleft.

7. *H. BREVISCAPA* HBK. Corm subglobose 5–7 mm. thick, covered with dark brown, membranous sheaths disintegrating into tufts of fibers; leaves lanceolate, decidedly narrowed at the base, about 2 mm. broad, up to 1.2 dm. long, pilose; peduncles filiform, about 3.5 cm. long, 1–2-flowered; ovary and capsule pilose; perianth-segments narrowly elliptic, 3–4.5 mm. long; capsule subcylindric, 5–7 mm. long; seeds about 0.8–1.1 mm. in diameter, black, covered with a brown exfoliating outer coat that is flecked with iridescent material.—Gen. et Sp. Pl. i. 286 (1815).—Plateaus in South America.

H. breviscapa was reported by Humboldt, Bonpland and Kunth as coming from Brazil. The one sheet of herbarium material answering the description of this species, no. 1042, with seeds, *Miguel Bang* (hb. N. Y. Bot. Gard.), came from Bolivia. It shows the leaves narrow at the base as the Brazilian plant is described, and all but one of the plants have a single flower to each peduncle.

8. *H. MICRANTHA* Pollard. Corm subglobose to subcylindric, 4–12 mm. thick, covered with the dark membranaceous bases of the old leaves rarely disintegrating into bristly fibers; leaves linear-lanceolate, 1–6 mm. broad, 0.8–4 dm. long, pilose; peduncles pilose, 5–18 cm. long; ovary and capsule pilose; perianth-segments 3.5–15 mm. long, rather acute at the apex; capsule subglobose to subcylindric, 4–9 mm. long; seeds brown, covered with very numerous, minute, awl-shaped murications.—Pollard in Small, Fl. S. E. U. S. 287 and 1329 (1903).—Southern United States and adjacent islands. The fol-

lowing are referred here. NORTH CAROLINA: *G. McCarthy*, "type specimen," without seeds (hb. U. S. Nat. Mus.); *G. McCarthy*, without seeds (hb. U. S. Nat. Mus.); Wilmington, *Edwin B. Bartram*, without seeds (hb. N. Y. Bot. Gard.). SOUTH CAROLINA: pine barrens two miles north of Manning, Clarendon County, *Witmer Stone*, no. 72, with seeds (hb. Phil. Acad.); near Kittredge railroad station, Berkeley County, with seeds (loaned by Miss Bragg). FLORIDA: Apalachicola, with seeds (hb. Mo. Bot. Gard. no. 107259); Apalachicola, *Chapman*, with seeds (hb. N. Y. Bot. Gard.); Aspalaga,



FIG. 9. *H. breviscapa* and seed.

Chapman, with seeds (hb. Mo. Bot. Gard. nos. 760670 and 760671). MISSISSIPPI: *S. M. Tracy*, no. 5095, with seeds (hb. N. Y. Bot. Gard.); Biloxi, *S. M. Tracy*, no. 6418 (with seeds, hb. Mo. Bot. Gard. nos. 107313 and 107314, without seeds, hb. U. S. Nat. Mus., with seeds, hb. N. Y. Bot. Gard.). Most specimens from the above states, without seeds, I have omitted from this list. LOUISIANA: Natchitoches, *E. J. Palmer*, no. 7380, without seeds (hb. Mo. Bot. Gard.). TEXAS: Marshall, Harrison County, *E. L. Palmer*, no. 5316, without seeds (hb. Mo. Bot. Gard.); *Elihu Hall*, no. 632, without seeds (hb. U. S. Nat. Mus., hb. Gray, hb. N. Y. Bot. Gard.). ISLE OF PINES:

vicinity of San Pedro, pinelands, *N. L. Britton, Percy Wilson & A. D. Selby*, n^o. 14332, with seeds (hb. N. Y. Bot. Gard.).

This material was distributed mostly without a specific name, as *H. juncea* Smith, or in a few instances as *H. micrantha*.



FIG. 10. *H. micrantha* (left) and seed (below).
H. potosina (right) and seed (above).

9. *H. potosina*, n. sp., cormo globoso vel subcylindrato 0.8–1.3 cm. crasso vaginis membranaceis et saepe fibrillatis brunneis investo; foliis lineari-lanceolatis crassis dense pilosis (juventute subtus villosis) 1.2–4.8 mm. latis usque ad 3.5 dm. longis; pedunculis subfiliformibus canaliculatis pilosis 0.7–1.2 dm. longis uni- vel pauci-floris; ovario

capsulaeque dense pilosis; segmentis perianthii pilosis ellipticis 5-13 mm. longis; seminibus 0.8-0.9 mm. diametro brunneis, testa aculeis elongatis munita, funiculo foramineque atris a naevo lucido atro spathulato circumscriptis.

Corm globose to subcylindric, 0.8-1.3 cm. thick, covered with membranous and often fibrillous brown sheaths; leaves linear-lanceolate, coarse in texture and rather densely pilose (when young villous on the lower surface) 1.2-4.8 mm. broad, up to 3.5 dm. long; peduncles coarsely filiform, canaliculate, pilose, 0.7-1.2 dm. long, 1-few-flowered; ovary and capsule densely pilose; perianth with hairy elliptic segments 3-7.5 mm. long; capsule subcylindric to ellipsoidal, 5-13 mm. long; seeds 0.8-0.9 mm. in diameter, brown, the outer coat covered with sharp, prolonged murications; the black beak and hilum set in a lustrous, black, pyriform spot.—At high altitudes in Central Mexico. The following are referred here. SAN LUIS POTOSI: altitude 1830-2440 m. (6000-8000 feet), in region of San Luis Potosi, *Parry & Palmer*, no. 871, with seeds (hb. Gray, TYPE, hb. U. S. Nat. Mus., hb. Phil. Acad., hb. Mo. Bot. Gard.); low ground about San Luis Potosi, *Schaffner*, no. 545, with seeds (hb. Gray).

This material was distributed as *H. decumbens* L. but it differs from that species in having a fibrous base and rigid, coarsely veined, densely pilose leaves as well as in having very different seeds.

10. **H. Wrightii** (Baker), n. comb. Corm subglobose, 6-12 mm. thick, covered with membranous and somewhat fibrillous brown sheaths; leaves linear, canaliculate or involute, 0.4-3 mm. broad, up to 2.6 dm. long; peduncles filiform, pilose, 0.4-1.2 dm. long, 1-2-flowered; ovary and capsule densely pilose; perianth with lanceolate to narrowly elliptic, acutish segments, 0.4-8.1 cm. long; capsule subglobose or ellipsoidal, 4-6 mm. long; seeds 0.8-1.1 mm. in diameter, black, lustrous, the outer coat covered with flattened, truncated and crudely carved pebbling.—*H. juncea*, var. *Wrightii* Baker, Journ. Linn. Soc. xvii. 106 (1878).—Florida Keys, Bahama Islands and the West Indies. The following are referred here. FLORIDA KEYS: Pinelands, Big Pine Key, *J. K. & G. K. Small*, no. 5028, with seeds (hb. N. Y. Bot. Gard.). BAHAMA ISLANDS: moist, loamy clay and honeycomb limestone, pine region, about five miles southwest of Nassau, *A. E. Wright*, no. 271, without seeds (hb. Gray); New Providence, grassy places, race course, *N. L. Britton & L. J. K. Brace*, no. 286, with seeds (hb. N. Y. Bot. Gard.). CUBA: *C. Wright*, no. 3745 (distributed as *H. juncea*, var. *Wrightii*, with seeds, hb. Gray, hb. U. S. Nat. Mus., without seeds hb. N. Y. Bot. Gard.); near Monte Verde in eastern Cuba, *C. Wright*, January-July, 1859 (hb. Gray); province of Pinar del Rio between Pinar del Rio and Coloma, *N. L. Britton, E. G. Britton & J. F. Cowell*, no. 10062, without seeds (hb. N. Y. Bot. Gard.). ISLE OF PINES: *A. A. Taylor*,



FIG. 11. *H. Wrightii* and seed (left).
H. rugosperma and seed (right).

no. 71, without seeds (hb. U. S. Nat. Mus.); Neuva Gerona, *A. H. Curtiss*, without seeds (hb. N. Y. Bot. Gard.). PORTO RICO: near Bayamon, *Sintenis*, no. 1067, without seeds, (distributed as *H. de-*

cumbens L., hb. U. S. Nat. Mus.). The plants in the list above, unless otherwise marked, were distributed as *H. juncea* Smith.

H. juncea, var. *Wrightii* was the name given by Baker to number 239, collected by Charles Wright in Cuba, because it differed from true *H. juncea* in having the capsule sparsely pilose and the outer leaves disintegrating into setaceous fibers. I have not seen number 239. In the specimens that I have examined, the leaves of *H. juncea* may frequently disintegrate more or less into fibers at the base, but the Cuban plants always show this disintegration of their outer leaves. Superficially, although the leaves of the Cuban plants are very narrow, those of *H. juncea* are even narrower and appear filiform. Also the seeds are very different. *H. juncea* has black seeds with murications truncated and sharply sculptured, but the Cuban plant has drab seeds marked with low, flat or corrugated pebbling. I have seen no West Indian specimens with the characteristic seeds of *H. juncea*; therefore I am raising var. *Wrightii* to specific rank.

11. ***H. rugosperma***, n. sp., cormo globoso vel subcylindrato 0.6–1.5 cm. crasso, foliis exterioribus basi in fasciculo brunneo fibrarum dissolutis; foliis lineari-lanceolatis apice acutis pilosis 1.7–5 mm. latis usque 2.7 dm. longis; pedunculis subfiliformibus canaliculatis pilosis 0.4–1.2 dm. longis pauci-floris; ovario capsulaque dense pilosis; segmentis perianthii anguste ellipticis vel lanceolatis acutis 3–7 mm. longis; capsulis subcylindricis vel ellipsoideis 6–9 mm. longis; seminibus 0.8–1 mm. diametro brunneis, testa vesicula persistenti jugis confluentibus tenuibus et paullo rugosis irregulariter instructa.

Corm globose to subcylindric, 0.6–1.5 cm. thick; the outer leaves breaking up at the base into tufts of brown fibers; leaves linear-lanceolate, with an acute apex, pilose, 1.7–5 mm. broad, up to 2.7 dm. long; peduncles coarsely filiform, canaliculate, pilose, 0.4–1.2 dm. long; ovary and capsule densely pilose; perianth-segments narrowly elliptic or lanceolate, acute, 3–7 mm. long; capsule subcylindric or ellipsoidal, 6–9 mm. long; seeds 0.8–1 mm. in diameter, brown; the outer coat loose, persistent, irregularly covered with confluent, thin, slightly jagged crests.—In mountainous regions of Mexico and Central America. The following are referred here. JALISCO: cliffs near Guadalajara, *C. G. Pringle*, no. 2908, with seeds (hb. Gray, TYPE). GUATEMALA: Santa Rosa, altitude 915 m. (3000 feet), *Heyde & Lux*, no. 2934, with seeds (two sheets in hb. U. S. Nat. Mus., hb. Gray).

This material was distributed as *H. decumbens* L. but is easily distinguished from that species by its fibrous base and more pilose leaves as well as by its seeds.

12. **H. fibrata**, n. sp., cormo globoso vel subcylindrato 7–19 mm. crasso vaginis membranaceis brunneis et dense fibratis investo; foliis linearibus subrigidis 1.8–5 mm. latis 0.6–2.5 dm. longis pilosis;



FIG. 12. *H. fibrata* and seed (left).
H. humilis and seed (right).

pedunculis pilosis filiformibus 1.5–15 cm. longis uni- vel paucifloris; ovario capsulaque dense pilosis; segmentis perianthii anguste ellipticis 3–6 mm. longis; capsulis subcylindratis 5–9 mm. longis; seminibus brunneis processis firmis conicis subtruncatis haud confluentibus obsitis.

Corm globose to subcylindric, 7–19 mm. thick, covered with brown, membranous sheaths and dense fibers; leaves linear, rather rigid, 1.8–5 mm. broad, 0.6–2.5 dm. long, pilose; peduncles pilose, filiform, 1.5–15 cm. long, 1-few-flowered; ovary and capsule densely pilose, perianth-segments narrowly elliptic, 3–6 mm. long; capsule subcylindric, 5–9 mm. long; seeds brown, covered by firm, conical, rather truncated scarcely confluent processes.—Throughout Mexico. The following is selected as the TYPE of this species. PUEBLA: vicinity of Puebla, *Bro. Nicolas*, no. 5203, with seeds (hb. Gray, hb. Mo. Bot. Gard.). The following, although frequently without good seeds, are referred here. CHIHUAHUA: in the Sierra Madre, near Colonia Garcia, *C. H. T. Townsend & C. M. Barber*, no. 70 (hb. N. Y. Bot. Gard., hb. Mo. Bot. Gard., hb. U. S. Nat. Mus., hb. Gray). VERA CRUZ: near Santa Fé, *J. N. Rose & Robert Hay*, no. 5374 (hb. U. S. Nat. Mus.). JALISCO: Tapalpa, *Marcus E. Jones*, no. 469 (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard.). MEXICO: near Tultenango, *J. N. Rose & Robert Hay*, no. 5442 (hb. U. S. Nat. Mus.); Valley of Mexico, Pedregal near San Angel, *J. N. Rose & Walter Hough*, no. 4510 (hb. U. S. Nat. Mus.). MORELOS: Cuernavaca, *Chas. C. Deam*, no. 44 (hb. Gray). PUEBLA: vicinity of Puebla, *Bro. G. Arsène*, no. 1138 (hb. Gray, hb. Mo. Bot. Gard., hb. N. Y. Bot. Gard.). LOCALITY UNKNOWN: one sheet with very good seeds in the Gray herbarium.

This material was distributed mostly as *H. breviscapa* HBK. or sometimes as *H. decumbens* L.

13. *H. HUMILIS* HBK. Corm globose to subcylindric, 5–11 mm. thick, covered with brownish membranous or fibrillous sheaths; leaves linear, canaliculate and densely pilose, 0.8–2.8 mm. broad, up to 3.5 dm. long; peduncles filiform, pilose, 1–18 cm. long, 1–2-flowered; ovary and capsule densely pilose; perianth-segments narrowly elliptic, 3–5 mm. long; capsule subglobose, 3–6 mm. long; seeds 0.8–1.1 mm. in diameter, brown, the outer coat covered with numerous, firm, sharp-pointed murications; the beak and hilum small and black.—*Nov. Gen. et. Sp. Pl. i. 286 (1815). Niobe pratensis* Willd. ex Schultes, *Syst. Veg. vii. 762 (1830)*.—Fields in Mexico and South America. The following are referred here. HIDALGO: *Dr. Coulter*,¹ nos. 1546 and 1565, with seeds (hb. Gray). CHIAPAS: *C. A. Purpus*, no. 6966, with seeds (hb. Gray, hb. N. Y. Bot. Gard.). COLOMBIA: southwest of Las Cruces, Bogotá, altitude 2600–2700 m. (7931–8236

¹ According to Hemsley in *Biologia Centrali-Americana, Botany*, iv. Dr. Thomas Coulter "collected in California from 1831–1833, and then in Sonora . . . He also collected largely in Zimapan and Real del Monte, where he was Surgeon to one of the Mining Companies; but this appears to have been previous to his visit to California. His collection went to Trinity College, Dublin . . . After Coulter's death in 1843, Harvey distributed the duplicates of the collection, and the first set is at Kew." Since the two specimens in the Gray Herbarium do not seem like other north Mexican species probably they came from either Zimapan or Real del Monte both of which are in the state of Hidalgo.

ft.), *F. W. Pennell*, no. 2163, with seeds (hb. Gray, hb. N. Y. Bot. Gard.); plateau de Sta. Fé de Bogotá, 1861, ex herb. Parseval-Grandmaison, with seeds (hb. Gray.). EUCADOR: Quitensian Andes, *J. P. Couthouy*, 1855 (hb. Gray.). BOLIVIA: *Miguel Bang*, no. 1793, with seeds (hb. N. Y. Bot. Gard., hb. Mo. Bot. Gard., hb. Gray, hb. U. S. Nat. Mus.); *G. Mandon*, no. 1208, with seeds (hb. Gray, hb. N. Y. Bot. Gard.). ARGENTINA: *F. Kurtz*, no. 8386, with seeds (hb. N. Y. Bot. Gard.).

This material was distributed as *H. decumbens* L., *H. pusilla* HBK., and *H. humilis* HBK.

14. *H. MEXICANA* Schultes. Corm globose to subcylindric, 3–12 mm. thick, the membranous bases of the old leaves frequently forming somewhat fibrillous tufts; leaves linear-lanceolate, pilose, 1.2–4 mm. broad, up to 3.2 dm. long; peduncles filiform, canaliculate, densely pilose above, glabrescent below, 1.5–18 cm. long, 1–several-flowered; ovary and capsule densely pilose; perianth-segments linear or narrowly elliptic, 3–8 mm. long; capsule globose to subcylindric, 2.5–15 mm. long; seeds 0.8–1.1 mm. in diameter; the outer coat brown, muricate, with long, sharp processes, irregularly exfoliating in patches showing the black coat beneath; the beak and hilum prominent and black.—Schultes in Roemer and Schultes, Syst. Veg. vii. 761 (1830).—Along the bases of the mountain ranges of Mexico, northward into Arizona. The following are referred here. VERA CRUZ: near Santa Fé, *J. N. Rose & Jos. H. Painter*, no. 6522, without seeds (hb. U. S. Nat. Mus.); Orizaba, ex herb. Mus. Paris, no. 2830, without seeds (hb. Gray). TLAXCALA: Contadero, *J. N. Rose & Robert Hay*, no. 5967, without seeds (hb. U. S. Nat. Mus.). MEXICO: near Toluca, *J. N. Rose & Jos. H. Painter*, no. 6776, with seeds (hb. U. S. Nat. Mus.); Cima, *J. N. Rose & Jos. H. Painter*, no. 7187, without seeds (hb. U. S. Nat. Mus.); near Eslava, lava beds, altitude 2440 m. (8000 feet), *Rusby*, no. 339, with seeds (hb. N. Y. Bot. Gard.); near Eslava, *J. N. Rose & Jos. H. Painter*, no. 7140, with seeds (hb. U. S. Nat. Mus.); on Popocatepetl, *J. N. Rose & Robert Hay*, no. 6307, with seeds (hb. U. S. Nat. Mus.); Amecameca, *C. A. Purpus*, no. 1834, with seeds (hb. U. S. Nat. Mus., hb. Mo. Bot. Gard., hb. Gray). HIDALGO: between Pachuca and Real del Monte, *J. N. Rose & Jos. H. Painter*, no. 6683, with seeds (hb. U. S. Nat. Mus.); between Somoriel and Las Lajas, *J. N. Rose & Jos. H. Painter*, no. 9219, without seeds (hb. U. S. Nat. Mus.). SINALOA: in the foothills of the Sierra Madre, near Colomas, *J. N. Rose*, no. 1655, with seeds (hb. U. S. Nat. Mus.). CHIHUAHUA: damp places, pine plains, base of the Sierra Madre, *C. G. Pringle*, no. 1380, with seeds (hb. N. Y. Bot. Gard., hb. U. S. Nat. Mus., nos. 932928 and 36590, hb. Gray, hb. Phil. Acad.); near Colonia Garcia, *E. W. Nelson*, no. 6127, with seeds (hb. U. S. Nat. Mus.). ARIZONA: near Fort Huachuca at Tanner's Cañon, in sod, *Lemmon*, no. 2891, with seeds (hb. Gray);

Huachuca Mts., *J. G. Lemmon & wife*, with seeds (hb. U. S. Nat. Mus.).

This material was distributed as *H. decumbens* L.



FIG. 13. *H. mexicana* and seed (left),
H. catamarcensis and seed (right).

15. *H. catamarcensis*, n. sp., cormo subgloboso vel subcylindrato 5–9 mm. crasso vaginis membranaceis brunneis et saepe fibrillatis investo; foliis lineari-lanceolatis 1–3 mm. latis 1–1.9 dm. longis, pilosis; pedunculis filiformibus laxe adscendentibus vel recurvantibus 3.5–5 cm. longis, villosis praesertim ad apicem, uni- vel pauci-floris; ovario capsulaque sparse pilosis; segmentis perianthii lanceolatis ellipticis 3–5 mm. longis; pedicellis 3–6 mm. longis; capsulis subcylin-

dratis vel paullo ellipsoideis plerumque subglabris maturitate 4–6 mm. longis; seminibus 0.8–1 mm. diametro atris, partim parvis naevis testae brunneae investis.

Corm subglobose to subcylindric, 5–9 mm. thick, covered with membranous and often fibrillous brown sheaths; leaves linear-lanceolate, 1–3 mm. broad, 1–1.9 dm. long, pilose; peduncles filiform, loosely ascending or recurving, 3.5–5 cm. long, villous especially above, 1–few-flowered; ovary and capsule sparsely pilose; perianth-segments lanceolate, elliptic, 3–5 mm. long; pedicels 3–6 mm. long; capsule subcylindric or ellipsoid, usually rather glabrate at maturity, 4–6 mm. long; seeds 0.8–1 mm. in diameter, black, partially covered with small patches of a brown outer coat.—In northern Argentina. The following is referred here as the TYPE of this species. CATAMARCA: from the department of Andalgalá, *P. Jørgensen*, no. 1551, with seeds (hb. Gray, hb. U. S. Nat. Mus., hb. Mo. Bot. Gard.).

It was distributed as *H. decumbens* L.

(To be continued).

FURTHER NOTES ON THE PLANTS OF ISLE AU HAUT.—The following plants, collected on Isle au Haut, Knox County, Maine, during the past two years, deserve record. Let me acknowledge my indebtedness to Prof. Fernald for their determination, and for note and comment on their distribution, the “quotes” being all his.

RUBUS ORARIUS Blanchard “heretofore known from York County, Me., and from Cape Cod, Mass.” [RHODORA, xxiii. 268, where it is recorded from Digby County, Nova Scotia.]

RUBUS ARCUANS Fernald & St. John, Proc. Bost. Soc. Nat. Hist. xxxvi. 78, fig. 7 (1921). To this original record Prof. Fernald [RHODORA, xxiii. 272] has added other stations in Nova Scotia, and now on my specimen his comment is “first between Nova Scotia and Cape Cod.”

RUBUS MULTISPINUS Blanchard. “First northeast of Plymouth Co., Mass.” [For description see Torrey, vii. 7 (1907).]

ILEX GLABRA (L.) Gray. “First between Cape Ann and Nova Scotia.” This grows in considerable quantity, fifty plants or more, in a swamp near the long pond.

BARTONIA VIRGINICA (L.) BSP. [Recorded from Mt. Desert in Rand & Redfield’s Flora, p. 130.] I found only two plants in a moist cleft of rock on a lesser hill.

BARTONIA PANICULATA (Michx.) Robinson, var. INTERMEDIA Fernald. "First between Nova Scotia and the Blue Hills, Mass." [RHODORA, xxiii. 287 (1921).] Only one small plant found, in the same swamp in which *Ilex glabra* grows. This *Bartonia* has been discussed in RHODORA under the name *B. iodandra*.—NATHANIEL T. KIDDER, Milton, Massachusetts.

A STATION IN MAINE FOR *Ilex verticillata*, forma *chrysocarpa*.—Late in November of last year a young friend from Belgrade was coming to visit my school in Smithfield. Although only thirteen years of age this lad, Orel P. Stevens, has a very good knowledge of the flora and fauna of this vicinity and is a very close observer of nature. While still in Belgrade but not far from the line which separates the two towns, and the counties of Kennebec and Somerset, his keen eye, trained to detect anything unusual, discovered a shrub which looked "new." Upon investigation he decided it was of more than ordinary interest and brought some of the berry-laden branches to my school. I was interested at once and upon consulting the Manual decided it was the yellow-berried variety of the Black Alder, *Ilex verticillata*, forma *chrysocarpa*, Robinson, reported only from Georgetown, Massachusetts. A few days later I obtained some of the berries from the same shrub and sent specimens to the Gray Herbarium where the identification was verified. It is a pleasure to be able thus to report it from Maine.—HARRIET A. NYE, Fairfield Center, Maine.

Vol. 25, no. 294, including pages 85 to 100 and plate 139, was issued 20 June, 1923.

Vol. 25, no. 295, including pages 101 to 116 and portrait plate, was issued 7 July, 1923.

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